

Motorola[®] HOME Radio

SERVICE MANUAL

MODELS
51M1U
51M2U

CHASSIS
HS-283

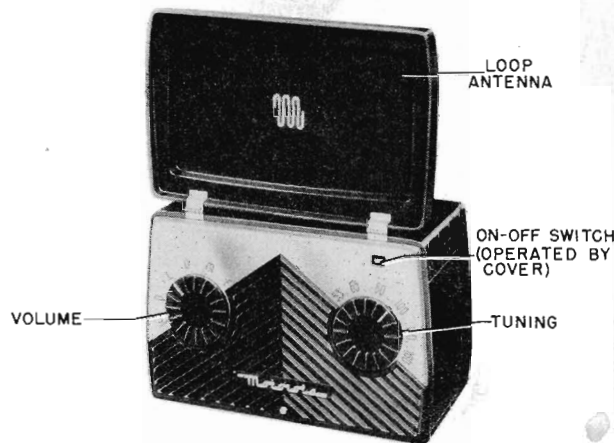
GENERAL INFORMATION

TYPE - Three-power (AC/DC, Battery) portable radio receiver. Four miniature type tubes and a selenium rectifier are used in a superheterodyne circuit.

Model	Color
51M1U	Green
51M2U	Maroon

TUNING RANGE - 535 to 1620 Kc IF - 455 Kc

TUBE COMPLEMENT	Type	Function
	1R5	Converter
	1U4	IF Amplifier
	1U5	Det, AVC & 1st AF Amp
	3S4	Power Amplifier
	Rectifier	Selenium type -for AC/DC operation



POWER SUPPLY - Operates from 117V AC/DC (15 watts) or from the following batteries:

2 - 1-1/2V flashlight cells (Eveready #950 or equivalent)

1 - 67-1/2V "B" battery (Eveready #467 or equivalent)

OPERATING INSTRUCTIONS

TO OPEN FRONT COVER. The front cover is opened by pushing upward on the "M" bar located in the center of the cover. The receiver is automatically turned on when the front cover is opened and raised to a vertical position.

TO OPEN BACK COVER. The back cover may be opened by gently pulling it at the top. When closing the cover, be careful not to pinch the power line cord or other leads between the cover and the cabinet.

117 VOLT AC OR DC OPERATION. The power cord is located inside the cabinet and may be reached by opening the back cover. Pass the line cord through the slot on the side of the receiver, and plug it into any 117 volt AC or DC power outlet. If the receiver does not operate from DC power, reverse the plug in the power outlet. When operating from AC power, reception may sometimes be improved by reversing the power plug in the outlet. It is not necessary that batteries be installed if the receiver is to be operated only from house power lines.

BATTERY OPERATION. Open the back cover and install the batteries, following the instructions on the label inside the back cover (or see Figure 1). Insert the line cord plug into the receptacle on the chassis, or the receiver will not play from batteries. If the receiver is to be operated for a long period of time from 117 volts AC or DC, or is to be placed in storage, remove the batteries and store them in a

cool place. IMPORTANT: Never leave low or run-down batteries in the receiver, as they will leak or swell and damage it.

TUNING CONTROL. Stations are tuned in with the right-hand knob. The markings around the tuning knob may be read in kilocycles by adding one zero to the figures.

VOLUME CONTROL. The left-hand knob controls volume.

TO TURN OFF. Closing the front cover will automatically turn off the receiver.

ANTENNA. A loop antenna is built into the front cover. Because of the slightly directional characteristics of the loop antenna, reception from some stations may be improved by rotating the entire receiver. In extremely noisy locations, rotate the receiver until minimum noise and maximum signal pick-up are obtained.

BATTERY REPLACEMENT. If low volume or fuzzy tone is noticed when operating from batteries, replace the flashlight cells. Normally, the 67-1/2V "B" battery will last for 3 or 4 changes of the flashlight cells. The condition of the batteries will not affect the operation of the receiver from 117 volts AC or DC. Complete battery replacement instructions will be found inside the cabinet back cover (or see Figure 1).

4545 AUGUSTA BOULEVARD

Motorola Inc.

CHICAGO 51, ILLINOIS

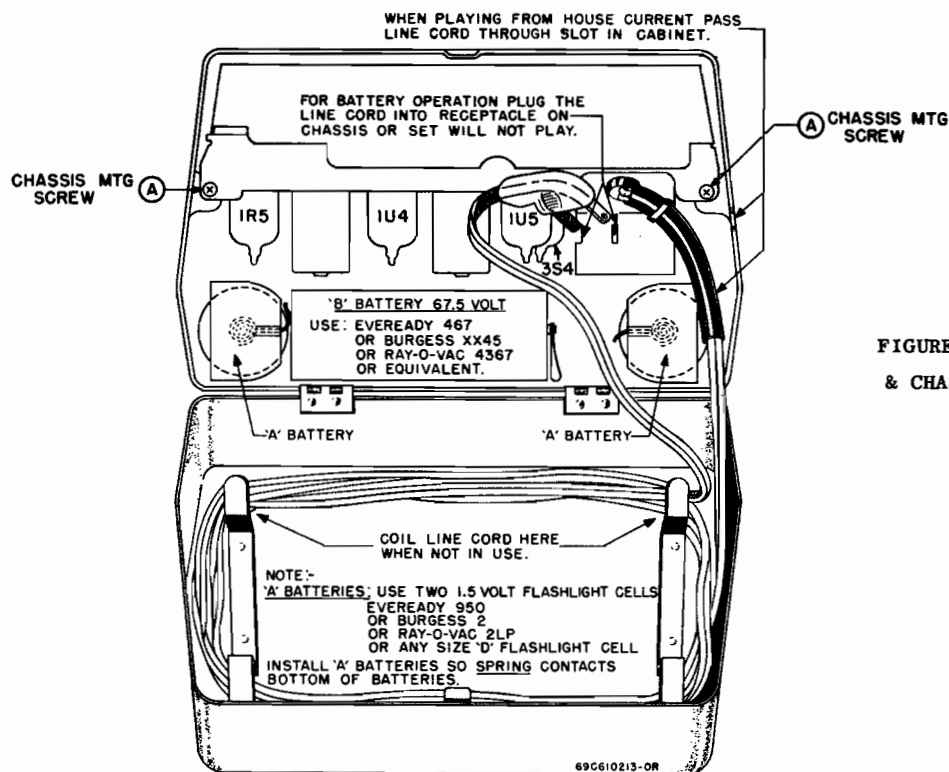


FIGURE 1. BATTERY INSTALLATION & CHASSIS REMOVAL INSTRUCTIONS

ALIGNMENT

NOTE: The receiver may be operated either from batteries or from the commercial power lines during alignment. If AC power is used, it is recommended that an isolation transformer be placed between the power line and the receiver. If an isolation transformer is not available, connect the low side of the signal generator to B- through a .1 mf capacitor.

1. Connect a low range output meter across the speaker voice coil.
2. Connect the low side of the signal generator to B-.
3. Set the signal generator for 400 cycle, 30% modulation.

4. Turn the receiver volume control to maximum.

5. Use a small fibre screwdriver for aligning the IF and diode transformers.

6. As stages are brought into alignment, reduce the signal generator input to keep the output of the receiver at approximately .05 watt (.05 watt = .40 volts on the output meter) to avoid overloading the receiver.

7. See Figure 2 for adjusting locations and the following chart for procedure.

ALIGNMENT CHART

STEP	DUMMY ANTENNA	GENERATOR CONNECTION	GENERATOR FREQUENCY	GANG SETTING	ADJUST	REMARKS
IF ALIGNMENT						
1.	.1 mf	Grid of conv (pin 6, 1R5)	455 Kc	Fully open	1, 2 & 3 (IF cores)	Adjust for maximum.
RF ALIGNMENT						
2.	.1 mf	Grid of conv (pin 6, 1R5)	1620 Kc	Fully open	4 (Osc)	Adjust for maximum.
3.	-	-	-	-	-	Install chassis in cabinet, leaving output meter connected to speaker.
4.	-	Radiation loop*	1400 Kc	Tune for max.	5 (Ant)	Adjust for maximum. Trimmer is reached through hole under plug button on side of cabinet.

* Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep loops at least 12" apart.

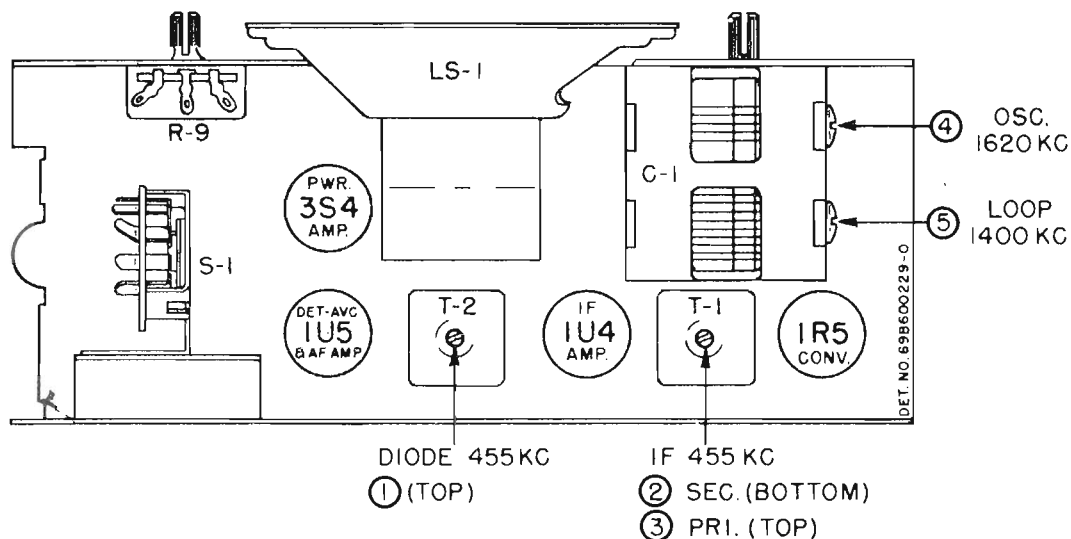


FIGURE 2. TUBE & TRIMMER LOCATIONS

SERVICE NOTES

The chassis of this receiver is isolated from the AC power line circuit by a capacitor-choke assembly to eliminate the shock hazard when handling the receiver. However, as an additional precaution when aligning or servicing the receiver from AC, an isolation transformer should be inserted between the power line and the chassis.

The tubes are exposed when the rear cover is opened. It is not necessary to remove the chassis to replace tubes.

TO REMOVE THE CHASSIS FROM THE CABINET:

1. Pull off the two control knobs on the front of the cabinet.
2. Open the rear cover and remove the batteries.
3. Remove the two Phillips head screws holding the chassis to the cabinet ("A" - "A" in Figure 1).
4. Slide the chassis out of the cabinet.
5. Disconnect the two leads from the chassis to the loop antenna hinges.

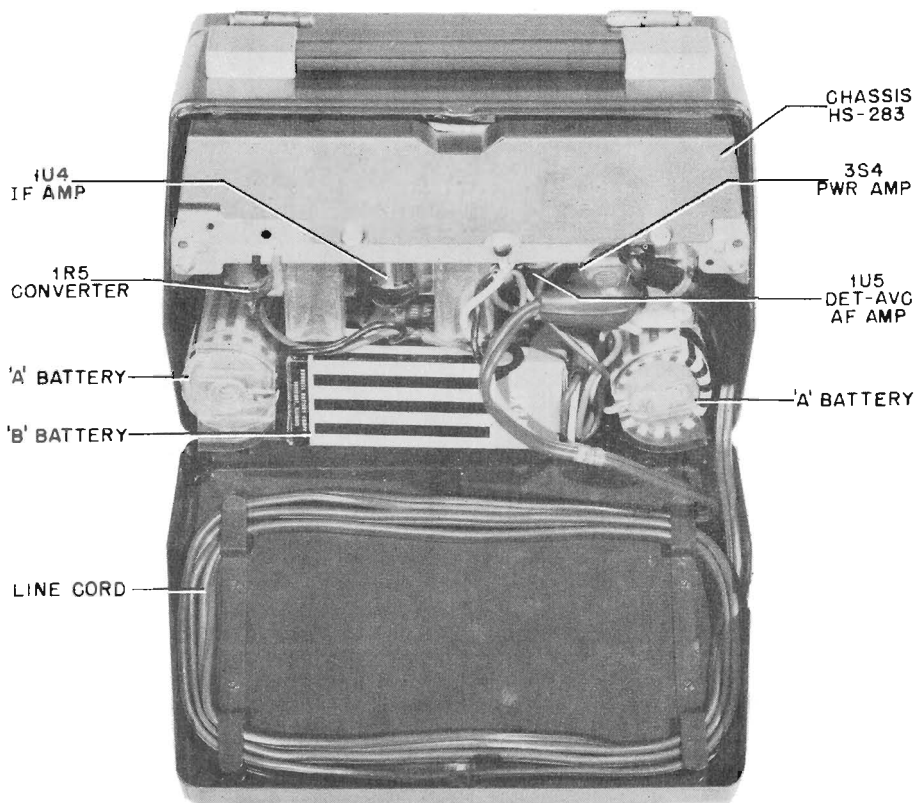


FIGURE 3. REAR VIEW OF RECEIVER

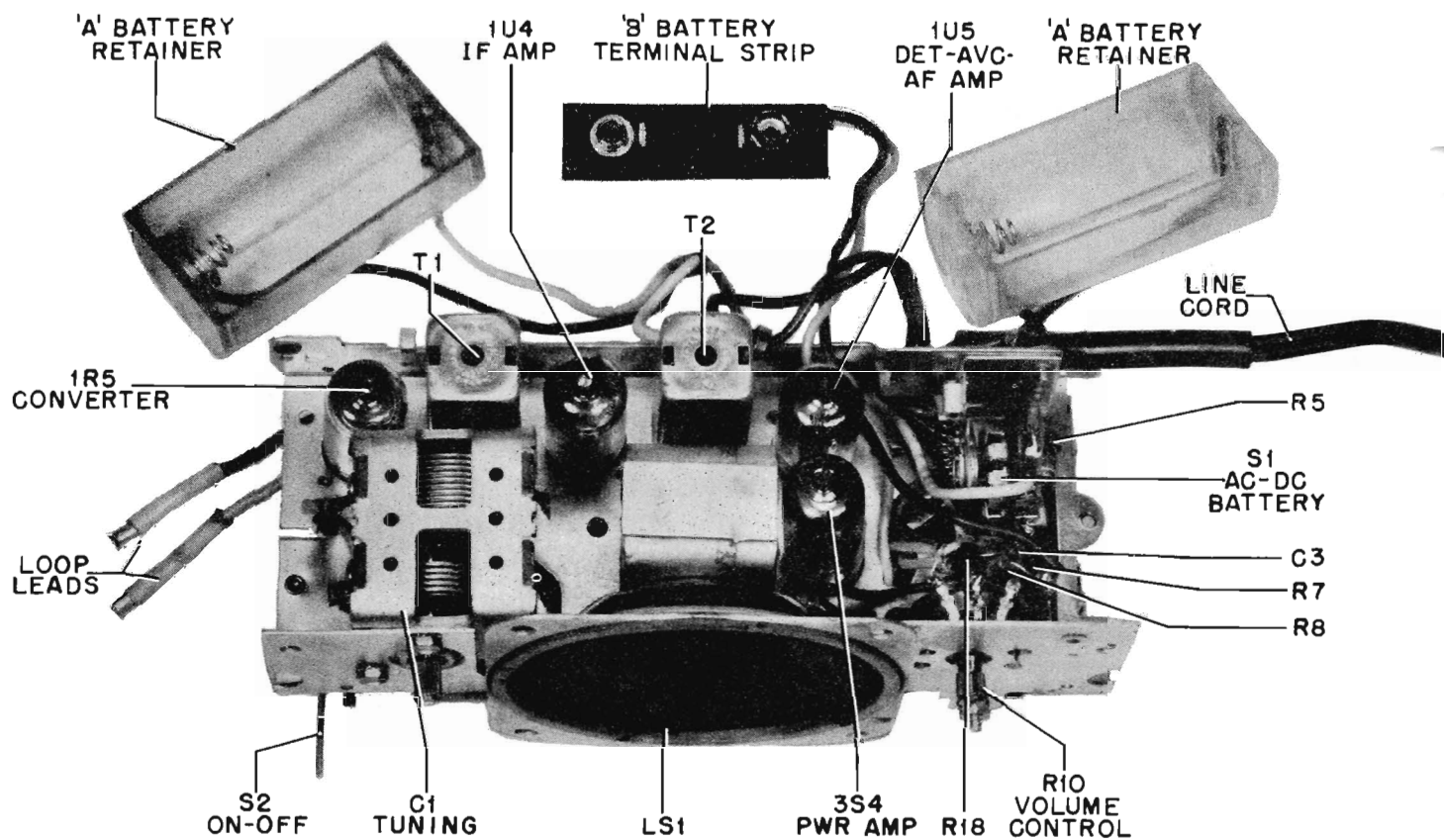


FIGURE 4. TOP VIEW OF CHASSIS

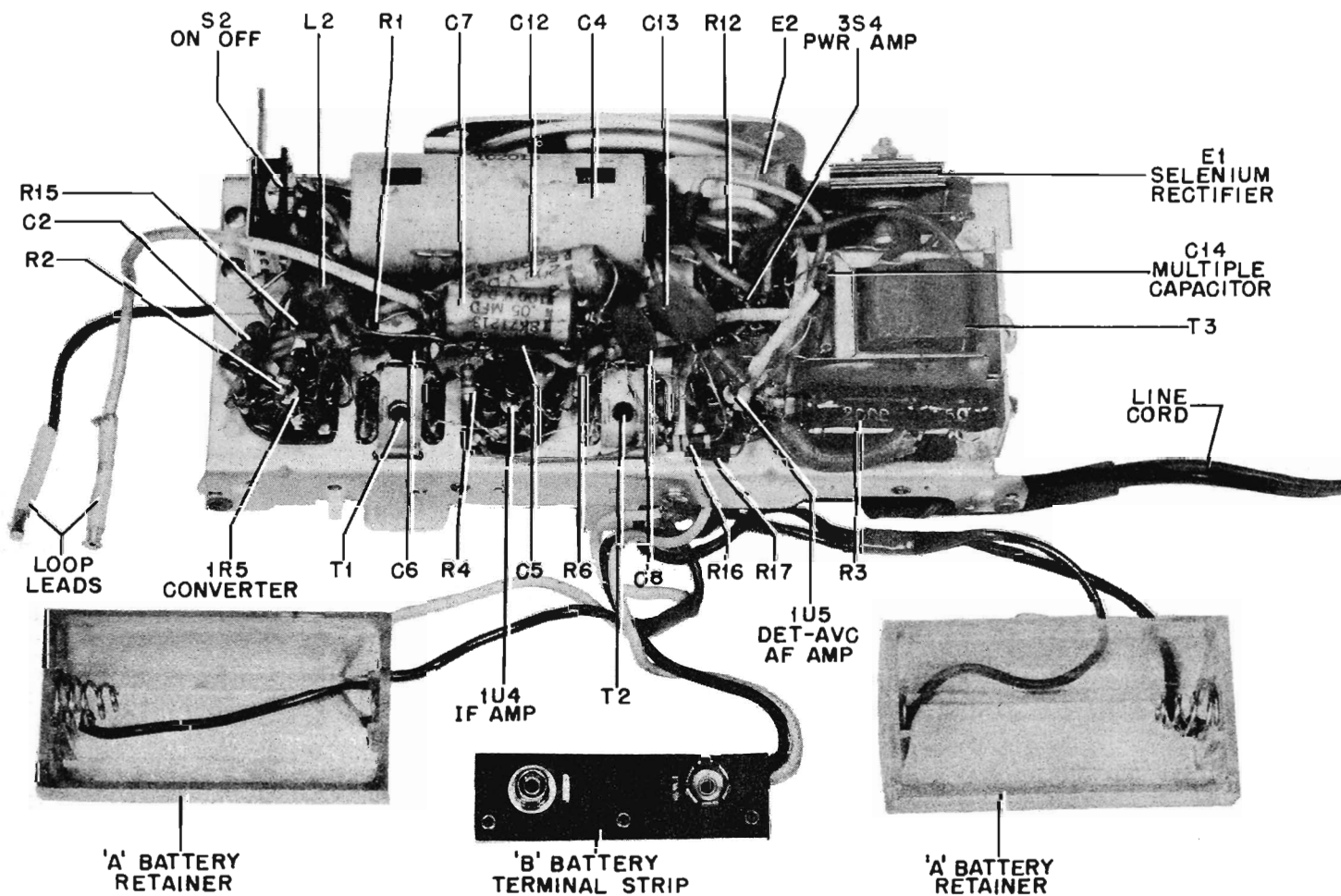


FIGURE 5. BOTTOM VIEW OF CHASSIS

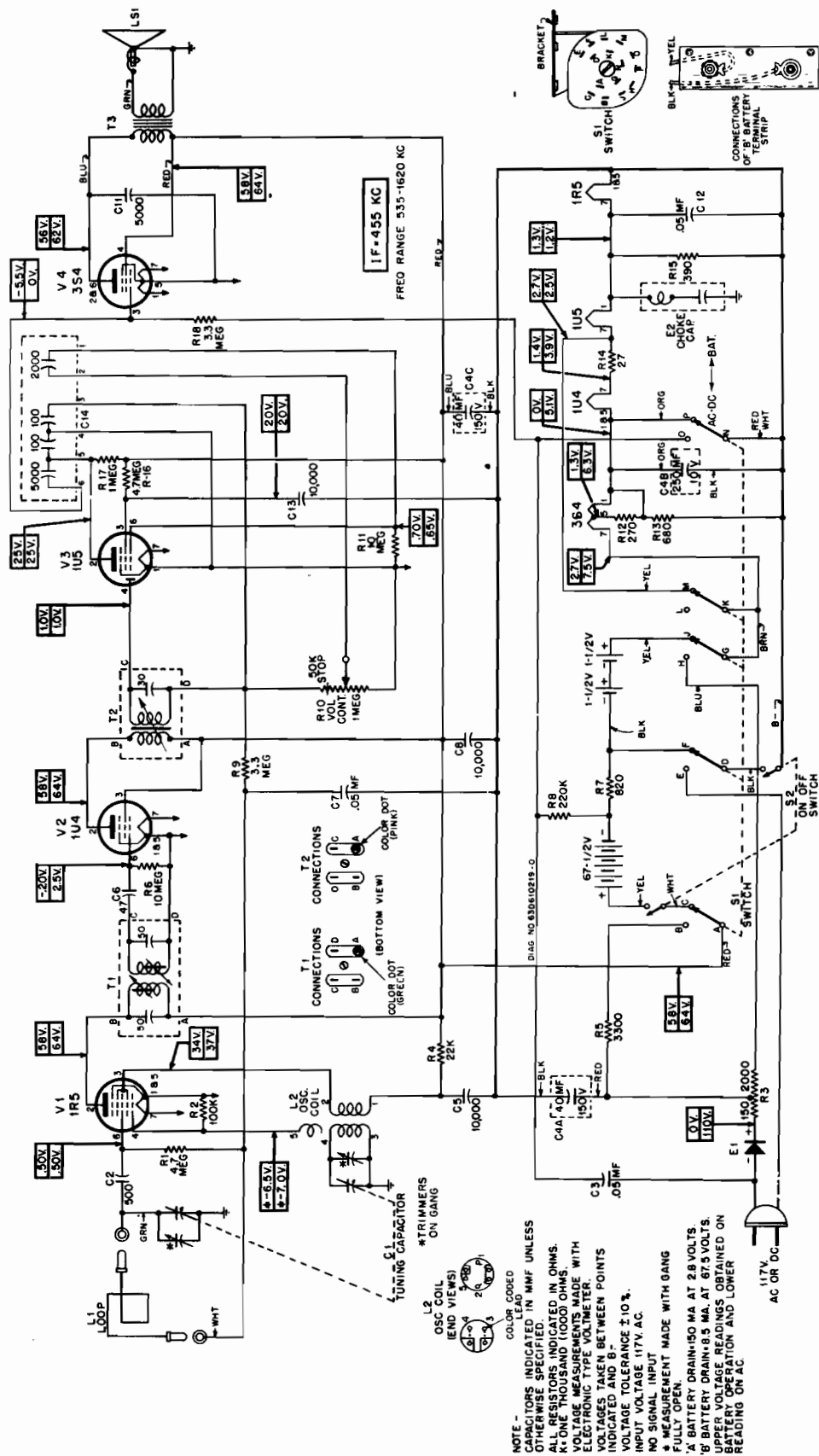


FIGURE 6. SCHEMATIC DIAGRAM OF CHASSIS USING MULTIPLE CERAMIC CAPACITOR PLATE

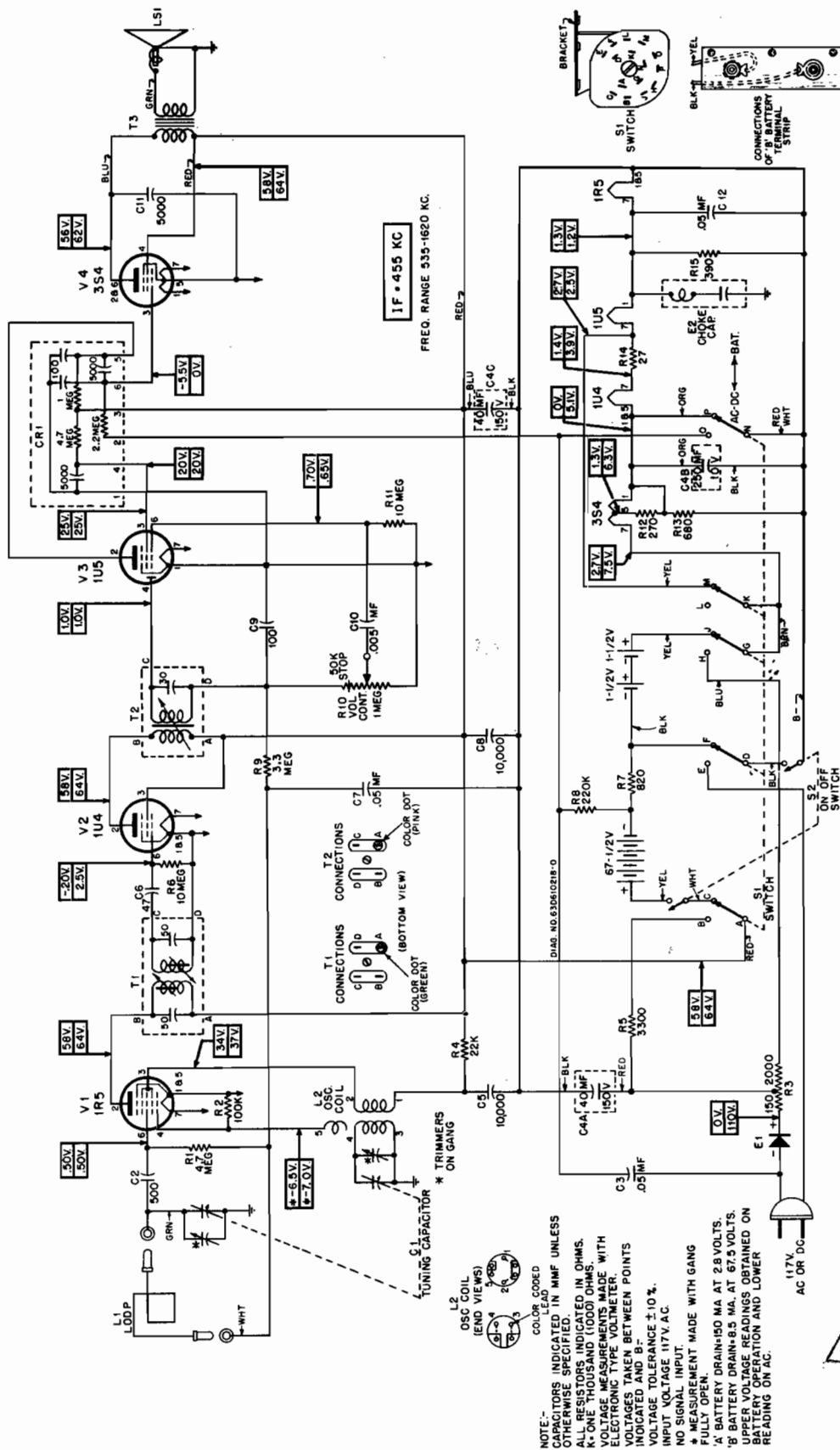


FIGURE 7. SCHEMATIC DIAGRAM OF CHASSIS USING MULTIPLE CERAMIC CAPACITOR-RESISTOR PLATE

REPLACEMENT PARTS LIST

NOTE: When ordering parts, specify model number of set in addition to part number and description of part.

Ref. No.	Part Number	Description	List Price	Ref. No.	Part Number	Description	List Price
CHASSIS PARTS - ELECTRICAL				Resistors			
C-1	19K692007	Variable, 2-gang.....	2.50	Note: All resistors are insulated, carbon type unless otherwise specified.			
C-2	21K481377	Ceramic: 500 mmf 500V.....	.20	R-1	6R2122	4.7 meg 20% 1/2W.....doz	1.20
C-3	8K471635	Paper: .05 mf 400V.....	.20	R-2	6R6031	100,000 10% 1/2W.....doz	1.20
C-4	23B691995	Electrolytic 40-40 mf 150V/ 250 mf 10V.....	1.75	R-3	17K692009	Wire wound: 2150 5% 10W; tapped.....	.80
C-5	21K482726	Ceramic, disc type: 10,000 mmf 450V.....	.30	R-4	6R6397	22,000 10% 1/2W.....doz	1.20
C-6	21K77373	Ceramic: 47 mmf 500V.....	.20	R-5	6R5581	3300 10% 1/2W.....doz	1.20
C-7	8K71213	Paper: .05 mf 100V.....	.20	R-6	6R2109	10 meg 20% 1/2W.....doz	1.20
C-8	21K482726	Ceramic, disc type: 10,000 mmf 450V.....	.30	R-7	6R6269	820 10% 1/2W.....doz	1.20
C-9	21B77286	Ceramic, disc type: 100 mmf 100V.....	.20	R-8	6R6015	220,000 20% 1/2W.....doz	1.20
C-10	8K24966	Ceramic, disc type: .005 mf 100V.....	.20	R-9	6R2118	3.3 meg 20% 1/2W.....doz	1.20
C-11	21A470789	Ceramic, disc type: 5000 mmf 450V.....	.30	R-10	18A691993	Volume control: 1 meg.....	.80
C-12	8K71213	Paper: .05 mf 100V.....	.20	R-11	6R2109	10 meg 20% 1/2W.....doz	1.20
C-13	21K482726	Ceramic, disc type: 10,000 mmf 450V.....	.30	R-12	6R6432	270 10% 1/2W.....doz	1.20
C-14	21K691992	Ceramic, multiple: 2000 mmf, 100 mmf, 100 mmf, 5000 mmf	.65	R-13	6R6040	680 10% 1/2W.....doz	1.20
Capacitor-Resistor				R-14	6R5683	27 10% 1/2W.....doz	1.20
CR-1	21B601036	Capacitor-Resistor: 5000 mmf, 5000 mmf; 100 mmf, 100 mmf, 4.7 meg, 2.2 meg, 1 meg.....	.65	R-15	6R5554	390 10% 1/2W.....doz	1.20
Choke Capacitor				R-16	6R2122	4.7 meg 20% 1/2W.....doz	1.20
E-2	24K691986	Choke & .05 mf 200V paper capacitor.....	.40	R-17	6R6004	1 meg 20% 1/2W.....doz	1.20
Rectifier				R-18	6R2118	3.3 meg 20% 1/2W.....doz	1.20
E-1	48B791092	Selenium Rectifier: half- wave.....	1.40	Switches			
Coils				S-1	40B471927	Rotary Switch, 5 PDT (AC/DC- Battery selector).....	1.15
L-1	1X692159	Antenna Loop & Front Cover Assembly: complete; green plastic (51M1U).....	5.25*	S-2	40A691999	Slide Switch (on-off).....	.50
	1X692160	Antenna Loop, Panel & Hinge Assembly: less front cover; green plastic (51M1U).....	2.90*	Transformers			
	24B692200	Antenna Loop & Panel Assem- bly: less hinges: green plastic (51M1U).....	1.40*	T-1	24K600824	IF Transformer, 455 Kc: complete with capacitors..	1.05
	1X600129	Antenna Loop & Front Cover Assembly: complete: maroon plastic (51M2U).....	5.25*	T-2	24K600825	Diode Transformer, 455 Kc: complete with capacitor...	1.05
	1X600130	Antenna Loop, Panel & Hinge Assembly: less front cover; maroon plastic (51M2U).....	2.90*	T-3	25K692006	Output transformer.....	.95
	24K600132	Antenna Loop & Panel Assem- bly: less hinges; maroon plastic (51M2U).....	1.40*	CHASSIS PARTS - MECHANICAL			
L-2	24K600097	Oscillator Coil (yellow code)	.75	43A692011	Bushing, insulator: fibre (chassis mtg screw insulators).....doz	.40	
Speaker				43A692012	Bushing, strain relief: line cord (use with 43K692013).....	.05	
LS-1	50K600141	Speaker: 3 1/2" PM; 3.2 ohm VC exch	2.65* 2.00	42K75826	Clip, electrolytic mtg.....doz	.40	
	or 50K600142			42A485584	Clip, IF transformer mtg.....doz	.20	
	or 50B610070			30K601777	Cord, line: with plug; 6 ft long..	.90	
				29R3020	Lug, soldering: battery contact (in "A" battery retainer).....doz	.20	
				9A470980	Receptacle, loop (on loop leads)doz	.25	
				15B481896	Retainer, "A" battery: plastic...	.15	
				43K692013	Retainer, strain relief (on line cord bushing).....	.05	
				26B692001	Shield, back (on rear of chassis)..	.15	
				26A692005	Shield heat (around R-3).....doz	.30	
				26B691996	Shield, switch (over AC/DC-Battery switch).....	.15	
				9A690129	Socket, tube: miniature; 7-prong..	.15	
				41K680029	Spring, battery contact (in "A" battery retainer).....doz	.20	
				31K470880	Strip, "B" battery terminal: with leads.....	.40	
				31K37504	Strip, terminal: 1 insulated lug, #1 mtg.....	.05	
				31K470746	Strip, terminal: 3 insulated lugs, #2 mtg.....	.05	
				4K470939	Washer, fibre (R-3 mtg).....per/c	.50	

Part Number	Description	List Price	Part Number	Description	List Price
MODEL 51M1U CABINET PARTS			3S400335	Screw, sheet metal: #2 x 5/16; Phillips flat head; blk nkl (mounts loop to front cover)...doz	.15
7A600092	Bracket, escutcheon support (cabinet front support).....	.05	3S490739	Screw, sheet metal: #4 x 1/4 PKZ; Phillips binder head (chassis mtg).....doz	.15
38K692050	Button, plug: green finish (loop trimmer adj hole cover).....	.10	3S2995	Screw, machine: 5-40 x 5/16 pl hex head; cad pl (handle mtg)...per/c	.50
1X601812	Cabinet: complete; less handle, grille and antenna loop and front cover assembly; green plastic.....	7.55*	41A470909	Spring, door latch (inside front cover).....doz	.55
42A600094	Clip, grille retainer (holds grille to cabinet).....doz	.30	41K692167	Spring, handle (inside plastic handle).....	.10
55A692058	Cover, handle mtg (over ends of handle).....	.40	41K601712	Spring, rear cover latch.....doz	.35
13D691949	Escutcheon, dial & volume (on front of cabinet).....	1.25	42A692189	Strap, door latch retainer (inside front cover).....	.10
55A27113	Foot, cabinet bottom: felt.....doz	.60	46A692151	Stud, latch retainer (front cover latch on grille).....	.05
1X692162	Front Cover Assembly: complete; less loop; green plastic.....	1.90	46K690079	Stud, trimount: blk nkl (on loop panel - for operating on-off switch).....	.25
1X692158	Grille Assembly: complete with escutcheon: green plastic.....	2.20	MODEL 51M2U CABINET PARTS-Same as Model 51M1U Except:		
55K692166	Handle, carrying: green plastic; less spring.....	.20	38K600106	Button, plug: maroon finish (loop trimmer adj hole cover).....	.10
55C692202	Hinge, front cover: complete; left-hand.....	1.15	1X601816	Cabinet: complete, less handle, grille and antenna loop and front cover assembly; maroon plastic....	7.55*
55K600087	Hinge, front cover: complete; right-hand.....	1.15	13K600956	Escutcheon, dial & volume (on front of cabinet).....	1.25
55K30198	Hinge, rear cover.....doz	.25	1X600131	Front Cover Assembly: complete, less loop; maroon plastic.....	1.90
36B691899	Knob, control: green plastic.....	.15	1X600128	Grille Assembly: complete with escutcheon; maroon plastic.....	2.20
1X692163	Latch and Plate Assembly (inside front cover).....	.30	55K600107	Handle, carrying: maroon plastic; less spring.....	.20
4S8406	Lockwasher, int: #2 (loop)...per/c	.50	36K600105	Knob, control: maroon plastic.....	.15
4S7695	Lockwasher, int: #5 (handle mtg).....per/c	.50	5S2827	Rivet: .088 x 5/32; stl; statuary bronze (front hinge mtg)....per/c	.50
29R5399	Lug, soldering (under front hinge, for loop connection).....per/c	.50	5S2828	Rivet: .088 x 3/16; stl; statuary bronze (front cover hinge mtg).....per/c	.50
13B691901	Medallion (on front cover).....	.40	3S400336	Screw, sheet metal: #2 x 5/16; Phillips flat head; statuary bronze (mounts loop to front cover)...doz	.15
28A692198	Pin, loop connector (on front hinge).....per/c	.50	46K680035	Stud, trimount: statuary bronze (on loop panel - for operating on-off switch).....doz	.25
64K601618	Plate, handle mtg (under handle mtg covers).....doz	.35			
5S8487	Rivet: .088 x 3/32; stl; blk nkl (rear cover hinges latch spring mtg).....per/c	.50			
5S8490	Rivet: .088 x 5/32; stl; blk nkl; (front hinge mtg).....per/c	.50			
5S7786	Rivet: .088 x 3/16; stl; blk nkl (front hinge mtg).....per/c	.50			
3S1512	Screw, machine: 4-40 x 3/8; Phillips round head (mounts front hinges to cabinet).....doz	.15			

*Plus Federal Excise Tax At Current Rate

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